

EP 330 CPA

Measuring reflectance for
oily gases derived
from paper

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910-CPA

EPO - Munich
45

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Oil tankers and tank
Sources: Also calculate for
from paper.

CLAIMS

1. An oil deterioration diagnosing method comprising
the steps of:

guiding at least two kinds of light rays of
different wavelengths emitted by two different
monochromatic light sources into oil by an illuminating
light guiding member;

guiding the light rays guided by the illuminating
light guiding member so as to travel a transmission
distance a through the oil;

guiding the transmitted light rays traveled through
the oil by a receiving light guiding member disposed
opposite to the illuminating light guiding member to a
light receiving unit;

calculating light transmission losses per unit
length ($\alpha \cdot \text{dB/mm}$) of the two kinds of light rays and the
light transmission loss difference ($\Delta \alpha \cdot \text{dB/mm}$) between the
light transmission losses per unit length of the two kinds
of light rays by an arithmetic and control unit; and

determining the degree of deterioration of the oil
through the comparison of the light transmission losses and
the light transmission loss difference with previously
stored data (master curves) representing the relation

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Master
Step diode
method

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between the degree of deterioration of the oil and light transmission losses and light transmission loss difference by the arithmetic and control unit.

2. The oil deterioration diagnosing method according to claim 1, wherein the monochromatic light sources are laser diodes or light-emitting diodes which emit light rays respectively having peak wavelengths in the range of 800 nm to 1500 nm.

3. The oil deterioration diagnosing method according to claim 1, wherein the illuminating light guiding member is incorporated into an oil level gage of the engine of an automobile.

4. An oil deterioration diagnosing apparatus comprising:

a light source unit comprising at least two monochromatic light sources capable of emitting light rays respectively having different wavelengths;

an illuminating light guiding member for guiding the light rays emitted by the light source unit into oil;

a receiving light guiding member disposed opposite to the illuminating light guiding member to guide the transmitted light rays to the outside after the light rays travel a transmission distance a through the oil;

a light receiving unit for measuring the respective

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intensities of the transmitted light rays by the receiving light guiding member; and

an arithmetic and control unit which calculates light transmission losses per unit length ($\alpha \cdot \text{dB/mm}$) of the two kinds of light rays and the light transmission loss difference ($\Delta \alpha \cdot \text{dB/mm}$) between the light transmission losses per unit length of the two kinds of light rays on the basis of the measured intensities of the transmitted light rays, and determining the degree of deterioration of the oil through the comparison of the light transmission loss and the light transmission loss difference with previously stored data (master curves) representing the relation between the degree of deterioration of the oil and light transmission losses and the relation between the degree of deterioration of the oil and light transmission loss.

5. The oil deterioration diagnosing apparatus according to claim 4, wherein the monochromatic light sources are laser diodes or light emitting diodes which emit light rays respectively having peak wavelengths in the range of 800 nm to 1500 nm.

6. The oil deterioration diagnosing apparatus according to claim 4, wherein the illuminating light guiding member is incorporated into an oil level gage

included in an engine included in an automobile.

7. The oil deterioration diagnosing apparatus according to claim 4, wherein a degree of deterioration of the oil determined by the arithmetic and control unit is indicated by an indication unit attached to the grip of an oil level gage included in an engine included in an automobile.

8. The oil deterioration diagnosing apparatus according to claim 4, wherein a degree of deterioration of the oil determined by the arithmetic and control unit is indicated by an indication unit installed on a meter panel placed in an automobile.

Papley
[initials]
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